Registration of Three Virus Resistant Sunflower Genetic Stocks

Three sunflower (Helianthus annuus L.) genetic stocks, SuMV-1 (Reg. no. GS-33, PI 642056), SuMV-2 (Reg. no. GS-34, PI 642057), and SuMV-3 (Reg. no. GS-35, PI 642058), resistant to Sunflower mosaic virus (SuMV, Potyviridae) were cooperatively developed and released by the USDA-ARS and the North Dakota Agricultural Experiment Station, Fargo, ND, in 2005. The SuMV was reported on wild sunflower (Helianthus annuus L.) and cultivated sunflower in Texas, with no resistance identified in cultivated sunflower. These genetic stocks will provide sources of resistance should SuMV become an economic problem.

Three wild H. annuus L. accessions from southern Texas, PI 435424 (Port Lavaca, TX), PI 435418 (Seabrook, TX), and PI 435437 (Freer, TX), were identified as having high frequencies of SuMV resistance in 2000, and subsequently used to create the genetic stocks. One resistant plant of each PI accession was crossed with a commonly used inbred line HA 89 (PI 599773), and three SuMV-resistant F1 plants of each accession was backcrossed with HA 89. Five resistant BC1F1 plants of each accession were either sib-pollinated or backcrossed with HA 89, followed by self-pollination and selection of homozygous resistant families. Resistant F4 families were identified and bulked F5 seeds of 30 F4 plants form the releases of SuMV1, SuMV2, and SuMV3.

SuMV1 is single-headed with a pedigree of 89/PI 435424/2*HA 89, F5 with black seed. SuMV2 is single-headed with a pedigree of 89, F3 with also black seed with gray stripes. SuMV3 is single-headed with a pedigree of PI 435437/2*HA 89, F3 and segregating for gray-mottled and brown seeds. Plants in each generation were artificially inoculated and scored for resistance in the greenhouse. SuMV1, SuMV2, and SuMV3 are homozygous resistant to the SuMV.

SuMV1, SuMV2, and SuMV3 flower in 80, 76, and 74 d after planting, have plant heights of 111, 101, and 81 cm, head diameter of 14.0, 12.6, and 3.7 cm, and 1000-seed weights of 44, 60, and 17 g, respectively. Self-pollinated seed set is 57, 70, and 32%, respectively, indicating varying degrees of self-incompatibility.

Limited quantities of seed of each genetic stock are available on request from the corresponding author for 5 yr. Recipients of seed are asked to make appropriate recognition of the source of the genetic stocks if they are used in the development of a new cultivar, germplasm, parental line, or hybrid.

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Registration by CSSA. Received 29 Dec. 2005. *Corresponding author (janc@fargo.ars.usda.gov).